

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application of:

Ying Feria

Serial No. 09/661,967

Group Art Unit: 2617

Filed: 09/14/2000

Examiner: Ly, Nghi H.

For: STRATOSPHERIC-BASED COMMUNICATION SYSTEM HAVING
INTERFERENCE CANCELLATION

Mail Stop Amendment
Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450

RENEWED AFFIDAVIT UNDER 37 C.F.R. 1.131

Dear Sir:

This Renewed Affidavit is submitted with a Renewed Petition Under 37 C.F.R. 1.183 because, as set forth therein, the inventors have constructively refused to sign the Declaration Under 37 C.F.R. 1.131. Accordingly, this Renewed Affidavit is signed by an authorized representative and accompanied by a 37 C.F.R. 3.73(b) Certificate.

I, Karen Lum, being an authorized representative of the Assignee, as set forth in the attached 37 C.F.R. 3.73(b) Certificate, in place of inventors Ying Feria, Ming Chang, Donald Chang, being duly sworn, depose and say:

1. Prior to August 31, 2000, the inventors of the subject application submitted an invention disclosure to the Hughes Electronics docketing department.

2. Prior to August 32, 2000, Michael W. Sales, Assistant General Patent Counsel Corporate Patents and Licensing of Hughes Electronics Corporation sent the attached Invention Disclosure to Kevin Mierzwa. This is attached hereto as Exhibit A.

3. The letter from Michael Sales enclosing the Invention Disclosure to outside counsel is submitted as Exhibit B.

4. Prior to August 31, 2000, John A. Artz acknowledged the receipt of the Invention Disclosure. This is attached hereto as Exhibit C.

5. On September 13, 2000, a final draft of the patent application was sent to Michael W. Sales of Hughes Electronics Corporation for filing. The letter to Michael W. Sales is included as Exhibit D. The draft of the patent application was prepared using the Invention Disclosure of Exhibit A which teaches a gateway station on page 4 of 7, a stratospheric platform on page 5 of 7, and interference cancelling on pages 5-7 of 7. Subtracting blocks are illustrated in Figure 1 of page 7 of 7 of the Invention Disclosure.

6. Each of the dates deleted from Exhibits A through C are prior to August 31, 2000.

Respectfully submitted,

Dated: January 17, 2008

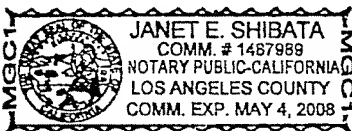
By: *Karen L. Lum*
Karen L. Lum, Assistant Secretary

STATE OF CALIFORNIA)
) SS:
COUNTY OF LOS ANGELES)

On January 17, 2008, before me, Janet E. Shibata, a Notary Public in and for said State, personally appeared KAREN L. LUM who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.



Janet E. Shibata
Notary Public

EXHIBIT A

SEND COMPLETED DISCLOSURE DIRECTLY TO:
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INVENTION DISCLOSURE
THIS INVENTION DISCLOSURE IS MADE
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AGREEMENT WITH HUGHES ELECTRONICS
CORPORATION AND/OR ITS SUBSIDIARIES
("HUGHES").

HUGHES

1. TITLE OF INVENTION

SHEET ³ / OF 7

Adaptive Interference Cancellation

2. INVENTOR(S)

| NAME | PAYROLL NO. | SOURCE CODE | LOC | BLDG | MS | PHONE | MANAGER |
|--------------|-------------|-------------|-----|------|------|----------|------------------------|
| Ying Feria | P5613 | TV 66 0E | SC | S41 | A392 | 662-7893 | Michelle Glaser Weiner |
| Ming Chang | 18450 | TV 66 01 | SC | S41 | A392 | 416-1920 | Art Smith |
| Donald Chang | 16435 | 08 10 30 | ES | 001 | A170 | 662-9374 | Wah Lim |

3. PROOF ON CONCEPTION

| | | | | |
|-------------------------------------------------------------------------|------|------------|---------------|-----------------------------------------|
| A. BY WHOM WAS FIRST DESCRIPTION WRITTEN OR DRAWING MADE? Ying Feria | DATE | TIME SPENT | ACCT. CHARGED | LOCATION OF FIRST DESCRIPTION / DRAWING |
| B. TO WHOM WAS INVENTION FIRST DISCLOSED? | DATE | | | |

4. REDUCTION TO PRACTICE

| | | | | | |
|-----------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|----------------------------|--------------|----------------|------------|
| A. WAS A DEVICE EMBODYING THE INVENTION CONSTRUCTED AND TESTED OR THE PROCESS PRACTICED? | YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> | BY WHOM | DATE STARTED | DATE COMPLETED | TIME SPENT |
| B. ACCOUNT CHARGED — TIME | ACCOUNT CHARGED — MATERIAL | PRESENT LOCATION OF DEVICE | | | |
| C. PRESENT LOCATION OF DOCUMENTS (DATE SIGNED AND WITNESSED), INCLUDING PHOTOS, DRAWINGS, AND DATA SHEETS SHOWING REDUCTION TO PRACTICE | | | | | |

NOTE: ALL EVIDENCE OF CONCEPTION (FIRST DRAWING AND FIRST WRITTEN DESCRIPTION) AND EVIDENCE OF REDUCTION TO PRACTICE (DEVICE EMBODYING THE INVENTION AND TEST DATA) MUST BE RETAINED.

5. RELATION TO GOVERNMENT CONTRACT

| | | |
|------------------------------------------------------------------------------|------------------------------------------------------------------------|---------------------------|
| A. DOES THIS INVENTION RELATE TO WORK PERFORMED UNDER A GOVERNMENT CONTRACT? | YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> | CONTRACT NUMBER AND TITLE |
| B. IS INVENTION BEING USED ON A GOVERNMENT CONTRACT? | YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> | CONTRACT NUMBER AND TITLE |

6. RELATED DOCUMENTS AND DISCLOSURE (BY YOU OR BY ANOTHER). PLEASE ATTACH COPY.

| | | | |
|---------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|------|----------------------------------|
| A. IS THERE A PUBLICATION OR PUBLIC PRESENTATION RELATED TO THE INVENTION? | YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> | DATE | IDENTIFY |
| B. ARE THERE ANY RELATED INVENTION DISCLOSURES OR PATENT APPLICATIONS? | YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> | DATE | IDENTIFY PD NO. ETC. |
| C. ARE THERE ANY PROPOSALS OR REPORTS OR OTHER DOCUMENTS RELATING TO THIS INVENTION? | YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> | DATE | IDENTIFY |
| D. HAS THE INVENTION BEEN USED, DISCUSSED, DEMONSTRATED OR OTHERWISE DISCLOSED OUTSIDE THE COMPANY (SUCH AS TO A VENDOR OR CUSTOMER)? | YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> | DATE | TO / FOR WHOM (COMPANY / PERSON) |

7. SALE

| | | | | | |
|---------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|---------------|------------|---------------|--------------------------|
| A. HAS PRODUCT EMBODYING INVENTION OR MADE BY INVENTION BEEN PROPOSED, SOLD, OR OFFERED FOR SALE? | YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> | ORDER NO. | ORDER DATE | DELIVERY DATE | DATE OFFERED OR PROPOSED |
| B. IS PRODUCT EMBODYING INVENTION OR MADE BY INVENTION IN A DELIVERABLE ITEM? | YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> | DELIVERY DATE | 200108 | | |

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Ying Feria

SIGNATURE INVENTOR
Donald Chang

SIGNATURE INVENTOR

236 CCS MAY 1999

DATE

DATE

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CORPORATE OFFICE**

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4

SHEET 4 OF 7

8. SUMMARY OF THE INVENTION

- A. GIVE A BRIEF DESCRIPTION OF YOUR INVENTION, PARTICULARLY POINTING OUT WHAT IS BELIEVED TO BE NOVEL (THE "HEART" OF WHAT IS NEW).

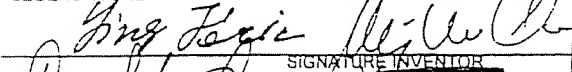

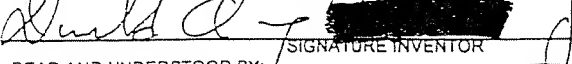
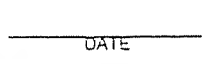
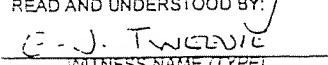

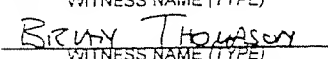

For a system where all the user traffic is going to one point on the ground, namely, the gateway station, signal processing may be used for interference cancellation. Because all the information about where each and every one of the users on the system is handled at one point, the information on each user's location is known and available to a single controller. Also since the resources are assigned to each user by the gateway station, the information on which users might be interfering each other is also known. With the above information, the interference can be completely or partially cancelled. In the case of a mobile user system, this interference cancellation can be adaptive in time.

- B. EXPLAIN THE PURPOSE AND ADVANTAGES OF YOUR INVENTION. (WHAT WILL THE INVENTION DO BETTER THAN DONE PREVIOUSLY?)


In a multiple user communication system where resources are reused for a higher capacity, interference may be a serious problem. To reduce interference level, the easiest way is to reduce the number of simultaneous users using the same resource (frequency or CDMA code). Clearly, this way of reduce interference is not desirable since it reduces the system capacity. A better way is to perform signal processing to cancel interference signals. In a system where all signals come to one point, this kind of cancellation is achievable.

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| | |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|  |  |
| SIGNATURE INVENTOR | DATE |
|  |  |
| SIGNATURE INVENTOR | DATE |
| READ AND UNDERSTOOD BY: | |
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| WITNESS NAME (TYPE) | DATE |
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| WITNESS NAME (TYPE) | DATE |

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5
SHEET 4 OF 7

8. SUMMARY OF THE INVENTION (Continued)

- C. IDENTIFY THE COMPANY PROGRAM OR PRODUCT LINE TO WHICH THE INVENTION APPLIES, AND THE EXPECTED VALUE TO THE PROGRAM OR PRODUCT LINE. ALSO IDENTIFY POTENTIAL COMMERCIAL APPLICATION OF THIS INVENTION, INCLUDING AUTOMOTIVE APPLICATIONS, IF ANY.

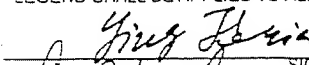
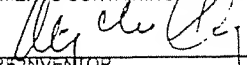


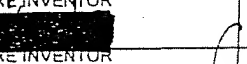
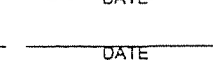
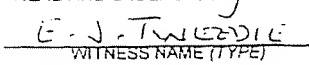


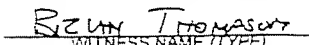
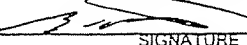
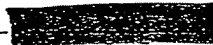
With this invention, programs such as Stratospheric Platform communication system will be enabled with a high capacity and low cost payload.

- D. IDENTIFY THE PRIOR ART KNOWN TO YOU WHICH IS IMPROVED UPON OR DISPLACED BY YOUR INVENTION, AND STATE IN DETAIL, IF KNOWN, THE DISADVANTAGES OF THE CLOSEST PRIOR ART.

Interference cancellation has been used in some communications systems to cancel the cross polarization interference. This technique has been applied in systems where cross polarization interference is severe. The cancellation is achievable in such systems because both signals, co-polarization and cross polarization signals, are available at one point. Expanding the application of interference cancellation to include cancellation of interference from other users is what this invention is about.

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| SIGNATURE INVENTOR | | DATE |
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| READ AND UNDERSTOOD BY: | | |
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| WITNESS NAME (TYPE) | SIGNATURE | DATE |
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| WITNESS NAME (TYPE) | SIGNATURE | DATE |

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6
SHEET 6 OF 7

9. DETAILED DESCRIPTION

DESCRIBE YOUR INVENTION IN DETAIL, USING NECESSARY ADDITIONAL SHEETS

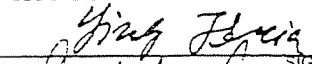
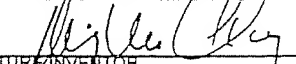
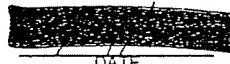
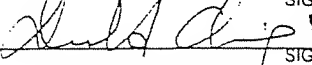
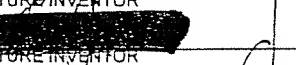
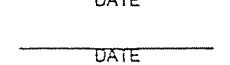
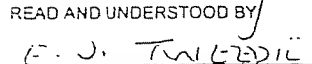
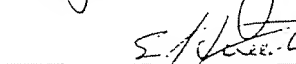

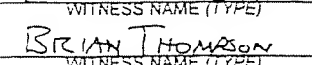
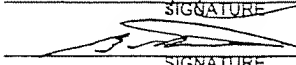
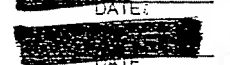
- A. BE SURE THAT EACH SHEET IS DATED, AND SIGNED BY EACH INVENTOR AND TWO WITNESSES.
(SHEET 6 SHOULD BE USED, IF PRACTICAL).
- B. ATTACH COPIES OF DRAWINGS OR DETAILED REPORTS HELPFUL IN UNDERSTANDING HOW YOUR
INVENTION WORKS
- C. IF YOUR INVENTION HAS BEEN TESTED, BRIEFLY SUMMARIZE THE TEST RESULTS WHICH CONFIRM THE
FUNCTIONS AND ADVANTAGES LISTED IN 8 B ABOVE.

In a spectrum limited communication system, to increase the total system capacity, the spectrum is reused as many times as possible. For a satellite or stratospheric platform communication system, interference from users using the same resource is suppressed by antenna discrimination. Unfortunately, this discrimination may not be sufficient in some cases due to other constraints such as weight and size of the antennas. However, for a system where all the user traffic is going through a gateway station, the interference source and level is known; therefore, the interference could be cancelled by subtracting a weighted interfering signal (see Figure 1).

The basis for this scheme to work is that the system management has all the information regarding the interference. First, it knows exactly where the interference comes from since the system management is assigning resources to the users. Users with the same resources assigned to them will interfere with each other at certain levels. The interference levels depend on the antenna sidelobe levels at the interferer location. The sidelobe level is known to the system management as well since it is forming the beams.

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| READ AND UNDERSTOOD BY | | |
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| WITNESS NAME (TYPE) | SIGNATURE | DATE |
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| WITNESS NAME (TYPE) | SIGNATURE | DATE |

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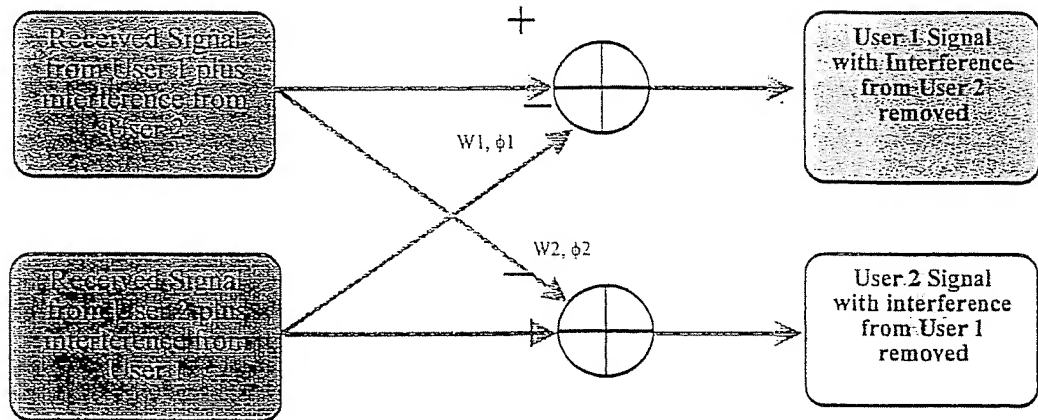


Figure1: Removing interference from known sources.

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Ying Fan Billie
SIGNATURE INVENTOR
David ...
SIGNATURE INVENTOR
READ AND UNDERSTOOD BY:
E. J. T...
WITNESS NAME (TYPE)
Brian Thompson
WITNESS NAME (TYPE)
...
SIGNATURE
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EXHIBIT B

Michael W. Sales VP AGC HE and General Patent Counsel



Building 001 M/S A109
Telephone: (310) 662-9916
Telefax: (310) 416-1216

VIA FEDERAL EXPRESS



Kevin Mierzwa, Esq.
Artz & Artz
28333 Telegraph Road
Suite 250
Southfield, MI 48034

Re: PD-200108 ADAPTIVE INTERFERENCE CANCELLATION
INVENTOR(S): Ying Fera (310) 662-7893
Ming Chang (310) 416-1920
Donald C. D. Chang (310) 662-9374

Dear Kevin:

Pursuant to your previous arrangements with our department, please proceed to prepare a patent application for the above disclosure at a cost not to exceed Fifty Five Hundred Dollars (\$5,500.00). This cost should include phone calls, messenger services and similar miscellaneous costs, as well as the cost of interviewing the inventors. Because the attached disclosure may be incomplete or additional embodiments may have been developed since its generation, at least one interview with the inventors may be required.

Please prepare two sets of claims for the application. One set of claims will be filed in the United States. The other set of claims will be filed in foreign countries and, therefore, should not use "means-plus-function" language, but should include reference numerals within parentheses and multiple dependencies where possible. Please try to limit the total number of claims in the second set to 10 or less.

PLEASE INCLUDE AN INDEPENDENT CLAIM DRAWN TO THE SYSTEM IN WHICH THE INVENTOR PROPOSES TO USE THE INVENTION. YOU MAY NEED TO OBTAIN A SYSTEM LEVEL BLOCK DIAGRAM FROM THE INVENTOR AS A SUPPORTING FIGURE.

To facilitate our filing of the U.S. patent application, your final draft of the application should be forwarded to me on numbered A4 paper. IN THE ABSTRACT PLEASE PROVIDE REFERENCE NUMERALS WITHIN PARENTHESES IN REFERENCE TO ONE FIGURE ONLY. The application should also be forwarded to me on a 3.5" diskette. On the diskette, please designate the word processing program used to generate the patent application.

Corporate Offices
200 N. Sepulveda Blvd.
P.O. Box 956
El Segundo, CA 90245-0956

Kevin Mierzwa

Page Two

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The final draft of the application should include formal drawings (approved by the inventor) on Bristol boards. YOU ARE REQUESTED TO UTILIZE YOUR OWN DRAFTSMEN FOR PREPARATION OF THE FORMAL DRAWINGS. The formal drawings must be accompanied by a list identifying the name of the element and its callout number.

PLEASE HAVE A FINAL DRAFT READY FOR FILING NO LATER THAN JUNE 1, 2000 IN ORDER TO MEET OUR FILING DEADLINES.

Of course, the subject matter disclosed in the application should be treated as proprietary to Hughes.

Invoices are to be submitted upon completion of the application. No partial billings will be accepted. When forwarding any billing information to Hughes, send the original documents to the attention of:

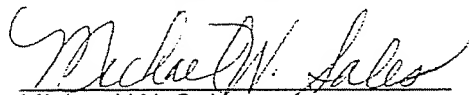
Ms. Kay Dunn
Hughes Electronics Corporation
200 N. Sepulveda Blvd.
ES 001/A110
P.O. Box 956
El Segundo, CA 90245-0956

Each inventor is being advised by this letter that you will be contacting him in the near future and that he should fully cooperate with you in writing this case.

If the foregoing terms are acceptable, please sign the attached copy of this letter in the space provided, then return to me as soon as possible.

If you have any questions, please call me at (310) 662-9916.

Very truly yours,
HUGHES ELECTRONICS CORPORATION



Michael W. Sales
Assistant General Patent Counsel
Corporate Patents and Licensing

ACCEPTED: _____
MWS:vcc
Enclosures: Invention Disclosure
Letter in duplicate
cc: (Inventors w/o atts.)

DATE: _____

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El Segundo, CA 90245-0956

EXHIBIT C

ARTZ & ARTZ PC

Attorneys & Counselors
Intellectual Property & Technology
Related Causes

John A. Artz
John S. Artz
Robert P. Renke
Kevin G. Mierzwa
Angela M. Brunetti
Franklin A. MacKenzie
Thomas E. Donohue
Steven W. Hays

Suite 250
28333 Telegraph Road
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Phone: (248) 223-9500
Fax: (248) 223-9522

[REDACTED]

Michael W. Sales
Corporate Offices
Hughes Space & Communications Company
200 N. Supluveda Blvd.
Post Office Box 956
El Segundo, CA 90245-0956

Re: U.S. Patent Application for:
"Adaptive Interference Cancellation"

Inventors: Harold Rosen
Ying Fera
P. Ramanujam

Your Reference: PD-200108

Our File No.: H 1216 PA

Dear Michael:

Thank you for your letter of [REDACTED] and the new patent disclosure. We have reviewed the invention disclosure and believe that we can prepare an application on this invention at a flat rate of \$5,000. Per your request, we will also prepare the formal drawings for \$150/sheet.

We will proceed to prepare a patent application on the new disclosure as soon as possible, noting from your letter that the final version is due by [REDACTED]

Very truly yours,



John A. Artz

JAA/mem

EXHIBIT D

ARTZ & ARTZ PC

Attorneys & Counselors
Intellectual Property & Technology
Related Causes

John A. Artz
John S. Artz
Robert P. Renke
Kevin G. Mierzwa
Angela M. Brunetti
Franklin A. MacKenzie
Thomas E. Donohue
Steven W. Hays

Philip R. Warn
(Of Counsel)

Suite 250
28333 Telegraph Road
Southfield, Michigan 48034
Phone: (248) 223-9500
Fax: (248) 223-9522

September 13, 2000

Michael W. Sales, Esq.
Hughes Electronics Corporation
Building 001 M/S A109
200 N. Sepulveda Blvd.
El Segundo, CA 90245-0956

Via Federal Express

Re: **U.S. Patent Application for**
"Stratospheric-Based Communication System For Mobile Users
Having Cross Canceling Interference Rejection"
Your Reference: PD-200108
Our File No.: H 1216 PA

Dear Mike:

Enclosed please find the final draft of the above-identified patent application which incorporates comments from the inventors. As you requested, we have also enclosed:

Two sets of claims (one with reference numerals)

One copy of the Specification on A4 paper

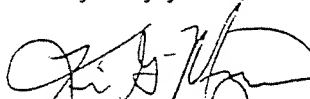
A 3.5" diskette containing the patent application and foreign claims (Word 97)

Formal drawings (4 copies)

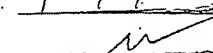
A separate Abstract containing reference numerals

Should you have any additional changes, or any questions regarding this application, please do not hesitate to contact me directly.

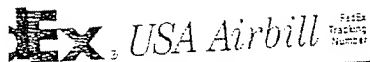
Very truly yours,


Kevin G. Mierzwa

ENTERED CPI

Date: 9-14-00
By: 

KGM/djk
Enclosure



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1/13/2000

Sender's FedEx
Account Number

2241-3511-4

Kevin G. Mierzwa

Phone (248) 223-9500

ARTZ & ARTZ

28333 TELEGRAPH RD STE 250

Day/Floor/Room

MOUTHFIELD

State MI

ZIP 48034

Internal Billing Reference H1213, H1215, H1216, H1217

Michael W. Sales

Phone ()

Hughes Electronics Corporation

200 N. Sepulveda Boulevard

We cannot deliver to P.O. boxes or P.O. ZIP codes.

BUILDING 001 M/S A109

Day/Floor/Room

E1 Segundo

State CA

XA

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See back for application instructions.

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Delivery to select locations☐ FedEx 2Day®
Second business day☐ FedEx Express Saver®
Third business day* FedEx Express Letter Bags not available
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Third business day

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* Declared value limit \$500

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Available for FedEx Priority
Overnight and FedEx 2Day
to select locations

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Shipper's Declaration
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